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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Hans SIGRIST et al.

Group Art Unit: 1656

Serial No.: 09/606,040

Examiner: Fariba Ghashghaei

Filed: June 29, 2000

For: PROCESS FOR THE MODIFICATION OF SURFACES

AMENDMENT UNDER 37 CFR 1.111

Commissioner for Patents
Washington, D. C. 20231

Sir:

In reply to the Office Action mailed August 29, 2001, please
undertake the following changes:

IN THE CLAIMS:

Amend claims 3, 5, and 7 as follows:

3. (Twice Amended) A process according to claim 1, wherein X
is the radical of a mono-, di-, tri- or tetrasaccharide.

B7

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B7
5. (Twice Amended) A process according to claim 1, wherein R is linear or branched C_2 - C_{24} -alkylene, which may be interrupted by -O- or -NR₃-, and R₃ is hydrogen or C_1 - C_4 -alkyl.

B7
7. (Twice Amended) A process according to claim 1, wherein R₁ is fluorine and n is an integer from 0 to 4.

Please add the following new claims:

B4
16. (New) A process according to claim 3, wherein X is the radical of a mono- or disaccharide.

B4
17. (New) A process according to claim 16, wherein X is the radical of a disaccharide.

18. (New) A process according to claim 5, wherein R is linear C_4 - C_{18} -alkylene.

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19. (New) A process according to claim 18, wherein R is
linear C_6 - C_{10} -alkylene.

Bf

20. (New) A process according to claim 7, wherein n is 0.

REMARKS

Claims 3, 5, and 7 have been amended to delete mention of the preferred and most preferred embodiments. New claims 16 to 20 have been added directed to the subject matter stricken from claims 3, 5, and 7. Thus, the claims before the Examiner for consideration are claims 1 to 11 and 16 to 20. Claims 12 to 15 stand withdrawn following applicants' election of the subject matter of claims 1 to 11. The Examiner is also directed to the Confirmation of Telephone Election filed July 19, 2001.

The rejection of claim 3 under the second paragraph of 35 USC 112 is believed moot in view of the change to that claim discussed above.

The rejections of claims 1 and 2 under 35 USC 102 as anticipated by Sigrist et al. WO '425, claims 1 to 10 under 35 USC 102 as anticipated by Swan et al. '056, claims 1 to 11 under 35 USC 102 as anticipated by Leonard et al., claims 1 to 11 under 35 USC 102 as anticipated by Miyasaka et al. '808, claims 1 and 2 under 35 USC 102 as anticipated by Jacobsen et al. WO '557, claims 1 to 11 under 35 USC 102 as anticipated by Chevolut et al., and claims 1 to 11 under 35 USC 102 as anticipated by Chai-Gao et al. '802 are respectfully traversed.

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Applicants respectfully submit that none of the cited references teach or suggest a method for preparing a carbohydrate substrate on a material substrate wherein, following photochemical fixation of a mono- or oligosaccharide-containing material of formulae (1a) and (1b) of claim 1, there is an enzymatic attachment of at least one further carbohydrate to the X radicals of the modified surface attained according to the photochemical fixation steps previously recited in steps (a₁) or (a₂). See Example 5 on page 14 of the specification. The references all discuss various techniques for photochemical immobilization of oligosaccharides to substrates. There is no proper teaching or suggestion of the invention as claimed. The Examiner will note that various named inventors here are co-authors or joint inventors in a number of the cited references. Thus, they are familiar with the area of technology and appreciate and understand what is taught and what is not taught in the prior art.

Sigrist et al. WO '425 describes, among other things, photochemical immobilization of oligosaccharides using carbene generating reagents such as arlydiazirines as precursors. The publication has no mention of subsequent enzymatic attachment of at

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least one more carbohydrate to the saccharide radicals of the material surface.

Swan et al. '056 teaches photo-coimmobilization techniques for saccharide immobilization. There is no mention of enzymatic attachment of further carbohydrates as specified in step (b) of instant claim 1.

Leonard et al. discusses surface analytics for photoimmobilized monosaccharides but not attaching further carbohydrates using enzymatic attachment.

Miyasaka et al. '808 indicates that enzymes can be immobilized by photochemical methods and that the enzymes remain biologically active. The reference, however, does not have any teaching or suggestion of carbohydrate-modifying enzymes acting on immobilized saccharides. The techniques are dramatically different.

Jacobsen et al. WO '557 describes immobilizing biomolecules on carbon-containing surfaces using quinone compounds. Applicants' claim 1 step (b) is not mentioned.

Chevrolot et al. discusses synthesis and characterization of photolabel-derivatized monosaccharides. Nothing appears relating to applicants' claim 1 step (b).

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Chai-Gao et al. '802, owned by the present assignee, teaches that carbon-based materials and biomolecules are targets for binding, but such disclosure does not lead to the invention claimed here.

All rejections should be withdrawn. If the rejections are maintained, the Examiner is asked to indicate on the record specifically where the cited references teach step (b) of instant claim 1.

The Examiner is thanked for acknowledging receipt of the certified copy of priority document from the International Bureau and for citing the references provided in an Information Disclosure Statement.

In view of the foregoing revisions and remarks, it is respectfully submitted that claims 1 to 11 and 16 to 20 are in condition for allowance and a USPTO paper to those ends is earnestly solicited.

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If the only barrier to allowance is the presence of non-elected claims 12 to 15, the Examiner is authorized to cancel those claims for that express purpose.

Respectfully submitted,

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